

12.5 RADIATION PROTECTION PROGRAM

12.5.1 ORGANIZATION

12.5.1.1 Introduction

The Radiation Protection (RP) program at Susquehanna SES is developed and implemented to evaluate and document plant radiological conditions and assure that every reasonable effort is expended to maintain personnel exposure as low as reasonably achievable (ALARA). The instrumentation described in the following subsections may be replaced by equipment providing similar or improved capabilities.

12.5.1.2 Radiation Protection Organization and Responsibilities

The Susquehanna SES Radiation Protection Organization is composed of management, supervisory, professional-technical, and technician level employees. Figure 12.5-1, Radiation Protection Organization Chart, provides a chart of this organization.

The Radiation Protection Manager reports to the Plant Manager–Nuclear and is responsible for providing him with the information necessary to establish compliance with regulations pertaining to radiation safety, administration of station radiation protection requirements and ALARA. In addition, the Radiation Protection Manager is responsible for assuring that the Radiation Protection Staff is trained and retrained in operational radiation protection principles applicable to Susquehanna Nuclear, LLC.

The Radiological Operations Supervisor / Programs is responsible for implementing the Radiation Protection Program staff functions in Radwaste, Dosimetry, Respiratory Protection, and Radiation Protection Instrumentation and Sources. The Radiological Operations Supervisor / Programs assures that the technical content and adequacy of their responsible program(s) meet industrial and regulatory requirements. They also supervise the Radiation Protection Support Services group, which provides support for radioactive shipments.

The Radiological Operations Supervisor / ALARA is responsible for implementing the Radiation Protection Program staff functions in ALARA and also supervises the Radiation Protection Support Services group, which provides support for shielding and in-plant activities.

The Radiological Operations Supervisor / Operations is responsible for implementing the Radiation Protection Program staff functions and supervising the Radiation Protection Foremen. They also supervise the Radiation Protection Support Services group, which provides support for laundry supplies and pick-up, rad trash disposal, and decon activities.

The Radiation Protection Foremen supervise and coordinate Technicians in the implementation of the Radiation Protection Program.

The Radiation Protection Technicians implement the Radiation Protection Program by performing surveys and providing radiation protection support in accordance with Station radiation protection procedures.

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12.5.1.3 Authority

The Radiation Protection Manager or designee has the authority to cease any work activity when, in his professional judgement, worker radiological safety is jeopardized, or unnecessary personnel exposures are occurring.

The RP Foreman, and the ALARA Specialist, have the authority to conduct briefings and/or discussions with workers and supervisors regarding observed practices and ALARA recommendations. They have the independence and authority to assure that jobs are accomplished with minimal exposures. Independence from routine radiation protection activities allows the objectivity necessary for selective review and recommendation of RP controls for work planning packages such as Radiation Work Permits (RWP), work requests, and special maintenance procedures, in accordance with station procedures. The Radiation Protection Manager has delegated authority to the RP Foreman, and ALARA Specialist to cease work activity when radiological safety is jeopardized or unnecessary exposures are occurring.

The Radiological Operations Supervisor(s) and their subordinates have the authority to assure that jobs are conducted in accordance with radiation protection procedures and RWP requirements. The Radiation Protection Manager delegates authority to each of those individuals to cease any work activity which is not being performed in accordance with radiation protection procedures and RWP requirements.

The Radiation Protection Technicians implement radiation protection and RWP requirements under the direction of qualified supervision. These technicians have the authority to stop jobs in progress when radiological safety is jeopardized or exposures are not ALARA, subject later to concurrence by Radiation Protection Supervision as specified above.

12.5.1.4 Experience and Qualification

Each member of the staff shall meet or exceed the minimum qualifications requirements specified in FSAR Section 13.1.3, "Qualification Requirements for Nuclear Plant (On-Site) Personnel."

12.5.2 FACILITIES, EQUIPMENT & INSTRUMENTATION

12.5.2.1 Radiation Protection Facilities

12.5.2.1.1 Radiation Protection Office Facilities

The Radiation Protection office and ALARA office are located within the Susquehanna SES restricted area. Job Planning and Radiation Work Permit co-ordinations may be conducted at the Radiation Protection office or ALARA office. Portable instrumentation and supplies will be stored and maintained by Radiation Protection.

Restricted Area - An area, access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. Restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area. At SSES, this is synonymous with the area within the inner security fence.

12.5.2.1.2 Radiologically Controlled Area (RCA) Access/Egress Facilities

Radiological Controlled Area (RCA) - Any temporary or permanent area established on site by Radiation Protection, which is controlled for purposes of protection from exposure to radiation and radioactive materials. Typically, this zone is defined by the outer perimeters of the Turbine, Tool Room, Reactor, and Radwaste Buildings, to include portions of the Control Structure, LLRWHF, ISFSI, and temporary outside radioactive materials storage areas. This is synonymous with Controlled Zone.

Personnel monitoring equipment, such as hand and foot, whole body friskers, or Geiger-Mueller type friskers, will be located at the authorized exits from the RCA encompassing the reactor, turbine, tool room and radwaste buildings. Monitoring requirements for additional RCA's will be established as appropriate based on the types of activities occurring in these areas.

12.5.2.1.3 Local Change Facilities

Frequently occupied contaminated areas will have change facilities located near the entrances with appropriate protective clothing supplies to minimize the spread of contamination from work areas.

12.5.2.1.4 Decontamination Facilities

12.5.2.1.4.1 Personnel Decontamination Facilities

Personnel decontamination areas contain showers, sinks and decontamination supplies. Decontamination areas are vented through the applicable building ventilation system for filtration purposes prior to exhaust through the applicable building vent. Sinks and showers drain to the Radwaste building for processing. Appropriate type of personnel monitoring equipment will be readily available to these areas for personnel contamination monitoring.

12.5.2.1.4.2 Equipment Decontamination Facilities

Equipment/component decontamination activities may be performed at various work locations in the plant. A decontamination shop is located in the Radwaste Building, elevation 676. This facility is equipped with special equipment and features to accomplish effective decontamination.

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Washdown areas are also provided to facilitate equipment decontamination. The areas are typically provided with curbing for contamination control, drains which discharge into the applicable waste processing system, and filter ventilation prior to exhaust from the building exhaust vent. The following is a listing of equipment washdown areas:

| <u>Unit</u> | <u>Building</u> | <u>Number Of Stations</u> | <u>Elevation</u> |
|-------------|-----------------|-----------------------------------|------------------|
| 1 | Reactor | 1 | 818 |
| 1 | Turbine | 1 | 729 |
| 2 | Reactor | 1 | 818 |
| 2 | Turbine | 1 | 729 |

12.5.2.1.5 Respiratory Protection Facilities

A facility is provided in the Radwaste Building elevation 691 for the cleaning, inspection, maintenance and storage of respiratory protection equipment.

12.5.2.1.6 Laundry Facilities

Contaminated laundry is processed by an off-site vendor. A facility is provided onsite for the packaging and sorting of launderable items prior to shipment off-site for vendor processing.

12.5.2.1.7 Instrumentation Facilities

A calibration laboratory will be available for calibration, repair and storage of Radiation Protection Instrumentation.

Portable instruments will normally be calibrated in the instrument calibration laboratory, using appropriate electronic test equipment and radioactive sources. All calibration sources will be certified traceable to the National Institute of Standards and Technology (NIST). Licensed sources will be stored in locked source containers or in locked storage areas when not attended by qualified plant personnel.

Radiation Protection instrumentation will be purchased, maintained and calibrated in a manner which ensures that users are provided with properly operating and sufficiently accurate instrumentation.

Instrument and source accuracies shall not be assumed to be greater than the manufacturer's specified accuracy. Tolerances allowed during instrument calibration shall not exceed the accuracy required by the user.

Instrument calibration frequencies shall be determined based upon equipment history. In the event that instrumentation is found to be consistently out of calibration, the following options shall be evaluated to correct deficiencies:

- Equipment repair
- Equipment replacement
- Change in calibration technique
- Increased calibration frequency

12.5.2.1.8 Count Room Facilities

Radiation Protection counting equipment will be used in areas that prevent cross contamination of samples. Detectors will be provided with sufficient shielding to minimize background to the extent necessary to obtain the required lower limits of detection.

12.5.2.1.9 Chemistry/Radiochemistry Facilities

Chemistry/Radiochemistry facilities consist of a sample room, radiochemistry laboratory, and counting room.

The sample room is shielded with 1'6" concrete walls and contains cabinets with worktops, sink, wall mounted storage cabinets and a fume hood assembly exhausted through prefilter, H.E.P.A. and charcoal filters to the Turbine Building vent.

The laboratory will be utilized for sample preparation/analysis and contains filtered fume hoods with service air connection, refrigerator, utility tables, sinks, cabinets, and drawers. The concrete walls range in thickness from 1' to 3'2". Fume hoods are exhausted through prefilter, H.E.P.A., and charcoal filters to the Turbine Building vent and the sinks drain to the Chemical Drain Tanks for processing through the Liquid Radioactive Waste System. The laboratory instruments, other than counting instruments and an emergency shower/eyewash, are located in the laboratory.

The Counting Room is constructed with 1'6" concrete walls to provide a low background environment for analysis of radiochemistry samples of station effluents and process streams. Instrumentation, such as a gas flow proportional counter, liquid scintillation counter, and gamma spectroscopy systems will be utilized for counting and/or analysis of radiochemistry samples.

12.5.2.1.10 Restricted Area Access/Egress Facilities

The South Gate House building serves as the primary security access control point to the Station's Restricted Area. Portal monitors and/or Geiger-Mueller type friskers are normally maintained at this location for final confirmatory monitoring prior to leaving the Restricted Area.

12.5.2.2 Radiation Protection Equipment

12.5.2.2.1 Protective Clothing

Protective clothing will be worn in contaminated areas to prevent personnel contamination and aid in controlling the spread of surface contamination. Protective clothing available at Susquehanna SES will include (but is not limited to): reusable coveralls and lab coats, disposable coveralls and lab coats, plastic suits, surgeons caps, cloth hoods, plastic hoods, splash shields, cotton glove liners, cloth gloves, rubber gloves, disposable gloves, rubber shoe covers, rubber boots, and disposable shoe covers.

Protective clothing will be stored at selected local change areas. After use, reusable protective clothing will be laundered and monitored, or surveyed, packaged and shipped to an off-site vendor for laundering, or discarded as waste.

12.5.2.2.2 Respiratory Protective Equipment

Respiratory protective equipment will be used to minimize the intake of radioactive material when engineering controls are not practicable. The Respiratory Protection Program is described in Subsection 12.5.3.

Respiratory protective equipment utilized at Susquehanna SES will consist of National Institute of Occupational Safety and Health/Mine Safety and Health Administration, (N.I.O.S.H./M.S.H.A.) approved respiratory protection equipment or respiratory protective equipment approved in accordance with the requirements of 10CFR20.1705 and used within the Approval Limitations for Type and Mode of use. A variety of respiratory devices and sizes will be available to assure proper fit of the differing facial contours of personnel requiring respiratory protection. Sufficient quantities of respiratory protective equipment will be available to allow for the use, decontamination, maintenance, and repair of equipment.

Respiratory protective equipment will be available at selected locations. Respiratory protective equipment will be available for emergency use. N.I.O.S.H./M.S.H.A. approved emergency escape devices will be placed at locations where the potential exists for I.D.L.H. conditions (Immediate Danger to Life and Health).

12.5.2.2.3 Air Sampling Equipment

Particulate, iodine and gaseous airborne radioactively concentrations will be determined through the use of Continuous Air Monitors (CAMs) or by analyzing grab samples obtained from portable air samplers equipped with appropriate filter media as required. Volumes necessary for representative sampling will be specified in Radiation Protection procedures.

12.5.2.2.3.1 Continuous Air Monitors

CAMs will normally be used to sample selected areas for potential airborne concentrations. Manufacturers' recommended calibration will be performed as frequently as required to maintain proper flow rate and detector response. Detector response to a check source and operation of local alarms will be verified on a routine basis.

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12.5.2.2.3.2 Portable Air Samplers

Flow rates for portable air samplers will be optimized routinely using appropriate flow standards. Certification of flow standards shall be traceable to NIST.

12.5.2.2.3.3 Lapel Samplers

Lapel samplers will be available, as a supplement to larger portable samplers, for evaluating airborne concentrations that radiation workers may encounter. Flow rates for these samplers shall be optimized routinely using NIST traceable flow standards.

12.5.2.2.3.4 Sampling Media

Particulate and iodine airborne concentrations will be sampled using appropriate filter media. Charcoal and silver zeolite filter media will be available for iodine sampling.

12.5.2.2.3.5 Special Air Sampling

Tritium and noble gas sampling equipment will be available for gaseous air sampling.

12.5.2.2.4 Personnel Dosimetry

Self-reading dosimeters or electronic/alarming dosimeters will be made available to workers to supplement Dosimeter of Legal Record (DLR) readings.

Self-reading dosimeters will be tested for calibration response, transient movement after charging, and leakage prior to initial use, and on a routine basis thereafter.

Alarming dosimeters will be available for use when an audio alarm at a preset accumulated exposure or exposure rate may be advantageous. These dosimeters will be calibrated on a routine basis and following any repair affecting calibration. In addition to calibration, the response of these dosimeters will be checked routinely using an appropriate reference source.

A NVLAP (National Voluntary Laboratory Accreditation Program)-accredited dosimeter will be used as the DLR and will be the primary means used to determine the record dose to personnel. DLRs will be used for penetrating and non-penetrating doses and will normally be processed by a NVLAP-accredited facility with results evaluated by Radiation Protection personnel. Extremity monitoring devices will be available for issue when authorized by Radiation Protection personnel.

A performance testing program will be implemented to assure that the dosimeters and readers and associated hardware and software used to determine personnel doses are accurate.

When required, internally deposited radioactive material will be evaluated with a whole body counter sufficiently sensitive to detect (in the thyroid, lungs, or whole body), gamma-emitting radionuclides of interest, or invitro bioassays to detect gamma and non-gamma emitting nuclides. The whole body counter will be calibrated in accordance with Station procedures using phantoms and sources traceable to the NIST. The detectors will be used in conjunction with a multi-channel analyzer and/or computer processor and associated hardware and software to obtain a permanent record. A vendor whole body counting system on or off-site or another utility's whole body counting system may be used as an alternative or supplement to a Susquehanna SES whole body counter.

12.5.2.2.5 Miscellaneous Equipment

The following miscellaneous equipment is stored at various locations:

Contamination control supplies are provided including glove bags, containment tents, absorbent wipes, absorbent paper, rags, step-off pads, rope, plastic sheets, plastic bags, tape, signs, and protective clothing. Appropriate supplies may be assembled into kits and located throughout the plant to aid in the control of a contaminated spill.

Temporary shielding, such as lead bricks, lead sheets, and lead blankets, will be available to reduce radiation levels.

Respirator facepiece-to-face fit testing equipment is available for quantitative fit testing of individuals involved in the Respiratory Protection Program. Laser photometry or equivalent system is used for quantitative testing of individuals for the Respiratory Protection Program. Portable ventilation units shall be available to reduce airborne radioactive concentration.

12.5.2.3 Radiation Protection Instrumentation

Instruments for detecting and measuring alpha, beta, gamma, x-ray and neutron radiation will be available. Instrumentation will consist of count room instrumentation, portable radiation survey instruments, fixed radiation monitors, personnel contamination monitors, and other special instrumentation as required to accurately assess radiation or contamination. All instruments will be subjected to routine operational checks and calibrations to assure the accuracy of measurements of radioactivity and radiation levels. Secondary and laboratory standards traceable to NIST will be used to calibrate these instruments.

Background and efficiency checks of routinely used Radiation Protection counting equipment will be performed and these instruments will be recalibrated whenever their operation appears statistically out of limits specified in station procedures. Instruments shall also be calibrated following any repairs or adjustments affecting calibration efficiency. Sufficient quantities of instrumentation will be available to allow for use, calibration, maintenance, and repair.

The Radiation Protection gamma spectroscopy system will receive an energy and an efficiency calibration, prior to initial use. Energy and efficiency calibration checks will be conducted on a regularly scheduled basis thereafter. In addition, energy and efficiency calibrations shall be repeated following system repair or adjustments which would affect calibration or whenever the results of daily efficiency or energy checks indicate performance outside established tolerance limits.

12.5.2.3.1 Counting Room Instrumentation

Counting room instruments for radioactivity measurement and/or sample analysis shall include the following:

- gamma spectroscopy system with appropriate detector for the identification and measurement of gamma emitting radionuclides.
- Low background gas flow proportional counters to be used for gross alpha and gross beta measurements.
- Beta-gamma and alpha counter/scalers to be used for gross beta-gamma measurements at immediate work locations.

12.5.2.3.2 Portable Radiation Survey/Monitoring

Radiation Protection instrumentation located in selected areas will include sufficient numbers of the following instruments, or equivalent:

- Counter/scalers to be used for gross alpha or beta-gamma measurements of removable contamination and for screening of airborne activity samples.
- Geiger-Mueller beta-gamma survey meters to be used for detection of radioactive contamination.
- Ionization chamber beta-gamma survey meters which are capable of measuring the range of exposure rates required.
- Remote monitoring (telescoping probe) Geiger-Mueller beta-gamma survey meters to be used for exposure rate measurements.

12.5.2.3.3 Contamination Instrumentation

Personnel contamination instruments shall include: Geiger-Mueller type friskers, whole body friskers, and/or portal monitors.

Materials and equipment monitors shall include: Geiger-Mueller type friskers, tool monitors and dry active waste monitors.

All of these monitors shall be equipped with audible or visual alarms.

Contamination monitoring instrumentation will be calibrated prior to initial use and routinely thereafter, as necessary to maintain their required sensitivity to contamination. These monitors shall also be calibrated following any adjustment or repair that would affect their sensitivity.

12.5.2.3.4 Special Instrumentation

NIST traceable secondary standard air ionization chambers or equivalent will be used to establish exposure rates for gamma exposure rate calibration sources.

Test equipment required for Radiation Protection instrumentation calibration will be maintained, calibrated and controlled in accordance with station procedures. Such equipment will include:

- Pulse generators for calibrating pulse counting instruments, oscilloscopes, calibrated flow meters, voltmeters, etc.

12.5.3 PROCEDURES

The Radiation Protection Procedure Program, as described in this section, will be implemented by Susquehanna SES Radiation Protection Technical, Administrative, and As Low As Reasonably Achievable (ALARA) procedures in accordance with Section 13.5.

12.5.3.1 Control of Access and Stay Time in Radiation Areas

Physical and/or administrative controls (as required) will be instituted to assure the philosophy of maintaining personnel exposures as low as reasonably achievable (ALARA), as specified in Section 12.1, is implemented.

12.5.3.1.1 Physical Controls

12.5.3.1.1.1 Security Check Points

Security check points at the fence line perimeter will be a continuously manned physical control. A restricted area access list will be maintained at the security entrance and enforced through a Station-wide computerized security access control system. Any individual not on the access list must be accompanied by a person who is authorized unescorted restricted area access.

12.5.3.1.1.2 Security Doors

Although not primarily intended to control access to radiation areas, the security interlocked door system will assure only specifically trained and authorized individuals are able to open security entrances to the reactor building. Security entrances will be locked or provided with continual surveillance. Details of security access control are contained in the Susquehanna SES Security Plan.

12.5.3.1.1.3 Posting and Locking

A third physical control will be the posting and locking, as appropriate, of radiation, high radiation and very high radiation areas. Radiation areas, as defined in 10CFR20, will be posted in accordance with 10CFR20.1902(a). Plant areas that are routinely accessible will be surveyed in accordance with Station procedures to determine radiation levels. In addition to recording the results of these surveys in accordance with 10CFR20.2103, the radiation area signs will be evaluated by surveyors to ensure the signs reflect current conditions.

High radiation areas, as defined in 10CFR20, will be posted in accordance with 10CFR20.1902(b). These signs will be routinely evaluated to ensure the signs reflect current conditions. Surveys of high radiation areas will be performed and results recorded as above. Locking of high radiation areas will be in accordance with station procedures.

Very High Radiation areas, as defined in 10CFR20 will be posted in accordance with 10CFR20.1902(c), and additional measures shall be instituted to ensure that an individual is not able to gain unauthorized or inadvertent access.

SSES Unit 1 and Unit 2 Technical Specification 5.7 state alternatives to be used in lieu of the control device or alarm signal required by 10CFR20.1601.

12.5.3.1.1.4 Monitoring

When appropriate, monitoring of work activities will be provided to assure an adequate control of access and stay time in airborne and high radiation areas. Monitoring will be utilized when it is necessary to assure accurate record of working time as an assistance to the work group. In addition, it may be utilized for tasks involving large numbers of workers to assure control at the staging or entry point. Monitoring may also be provided for tasks in areas where conditions are unstable to assure that timely instructions to workers are issued.

12.5.3.1.2 Administrative Controls

12.5.3.1.2.1 Training

As specified in Subsection 12.5.3.7, personnel allowed unescorted restricted area access will receive Radiation Protection and related training in accordance with 10CFR19.12. During this training, the individual responsibility of utilizing proper radiation protection procedures in radiation, high radiation, very high radiation, contaminated, and airborne radioactivity areas will be emphasized. The methods utilized at Susquehanna SES to control access physically and administratively will be reviewed.

12.5.3.1.2.2 Radiation Work Permit

The Radiation Work Permit (RWP) system described in Subsection 12.5.3.2 will be implemented to administratively control access and stay time in radiation, high radiation, very high radiation, contaminated, and airborne radioactivity areas. Work in radiation, contamination or airborne levels greater than limits specified by Station procedures will require the completion and approval of a RWP. The RWP will be reviewed and approved in accordance with station procedures. Approved RWPs will specify access requirements as well as special instructions. An approved RWP will be considered in effect until conditions warrant a change or until work is completed. RWP's are subject to immediate cancellation or revision by Radiation Protection Supervision. Each RWP will be reviewed after termination by Radiation Protection.

12.5.3.1.2.3 Reporting Requirement

The individual responsibility to report, through proper chain of command, any violation of Federal Regulations or Station procedures will be emphasized during training sessions. Violation involving potential overexposure of personnel to radiation or radioactive material will be reported through appropriate channels to the Site Vice President/Plant Manager-Nuclear or designated alternate. Appropriate action will be taken to prevent recurrence. Any individual who violates station procedures will be subject to disciplinary action.

12.5.3.1.2.4 Independent Review

A member of Radiation Protection Supervision will periodically observe activities in work areas to review the effectiveness of specified precautions. In addition, a member of Radiation Protection supervision may perform independent measurements of radiation levels to assure that areas are properly posted to indicate accurate readings. During these surveys, the reviewer will determine that every reasonable effort has been expended to minimize inadvertent entry into radiation areas.

12.5.3.1.2.5 Procedure Review

Radiation Protection procedures related to control of access and stay time in radiologically controlled areas will at all times be subject to review to assure every reasonable administrative effort has been expended to minimize personnel exposure. Recommended changes will be evaluated and, if necessary, a proposed change will be forwarded through appropriate review and approval channels.

Radiation Protection procedures will be periodically reviewed in accordance with the station administrative procedure(s).

12.5.3.2 Assuring that Occupational Radiation Exposure (ORE) Will Be As Low As Reasonably Achievable (ALARA)

To effectively implement the corporate ALARA commitment as stated in Section 12.1, a station ALARA program will be utilized to assure that activities are performed with the lowest practicable personnel exposure. Susquehanna Nuclear, LLC considers it necessary to apply the basic concepts of ALARA to internal and external exposure to assure that the Total Effective Dose Equivalent (TEDE) is maintained ALARA. Procedures employed to implement the program described in this section will be subject to review and revision to assure the ALARA program is responsive to plant conditions.

12.5.3.2.1 ALARA Procedures Common to External and Internal Exposure

12.5.3.2.1.1 Training

Individuals allowed unescorted restricted area access will receive radiation protection training as described in Subsection 12.5.3.7. The individual responsibility of assuring that unnecessary exposure is to be avoided will be emphasized during radiation protection training sessions.

As appropriate, individuals involved in potentially high dose accumulating jobs will receive pre-job instruction in exposure reduction techniques and controls applicable to the specific job.

12.5.3.2.1.2 Radiation Work Permit

When radiation dose rates, anticipated accumulated exposures, airborne concentrations, or contamination levels exceed limits specified by station procedures, a Radiation Work Permit (RWP) will be initiated, completed and approved prior to commencement of scheduled work. As a minimum, station procedures will specify that work in greater than 100 mrem/hr areas will require a RWP.

Radiation Protection will evaluate the radiological conditions associated with the work to be performed. Based upon evaluation of proposed work, job history, estimated dose and surveys, Radiation Protection will specify the appropriate protective clothing/devices, respiratory protective equipment, dosimetry, surveys, and precautions to be taken.

The RWP will be evaluated to assure the work will be performed from an ALARA approach. As appropriate, the evaluation will include review of proposed special tools, remote handling devices, access and communications needs, minimum manpower requirements, use of mock-ups and work which may be performed outside of the RWP area to increase job efficiency and reduce personnel exposures. Potential incidents such as fires, spills, and equipment failure will be evaluated and proper response action discussed with radiation workers, when applicable. For high dose accumulating work, job preplanning will include person-rem estimates, comparison with similar jobs, establishing exposure goals, and simulated dry runs, as appropriate, to increase job efficiency, as defined in station procedures.

Radiological engineering controls will be used, when applicable, to minimize personnel exposures and/or inhalation/ingestion of radioactive material and prevent the spread of contamination. Controls such as flushing of tanks and lines, use of temporary shielding, use of proper ventilation and purging, and properly filtered temporary exhaust will be considered. In addition, other effective methods of reducing person-rem exposures and potential intake of radioactive material will be considered. When airborne concentrations cannot reasonably be reduced below levels described in station procedures, the use of respiratory protective devices will be considered.

The RWP will be approved and signed by Radiation Protection. RWP implementation and approval process will be detailed in Station procedures.

A member of Radiation Protection supervision will selectively review completed and returned RWPs. Selection, on a variety of bases, of those RWPs which should receive a post operation evaluation will be made. Arrangements will be made, when necessary, to hold a debriefing session with the responsible supervisor and/or workers. Debriefing and RWP review will be conducted when unexpected airborne concentrations, high total doses or high individual doses are encountered. Debriefing will emphasize and analyze problems or difficulties encountered during performance of work. In accordance with Station procedures, alternative work methods will be discussed and if improvements are justified, the responsible supervisor will initiate the review, approval and implementation process.

12.5.3.2.1.3 Work Scheduling

Radiation Protection will maintain a data base from which reports can be generated for supervisors, that will indicate individual exposure status to assist in work scheduling and assure individual exposures are minimized.

12.5.3.2.1.4 Reporting Requirements

This paragraph reserved. Topic covered in Section 12.5.3.1.2.3.

12.5.3.2.1.5 Internal Program Reviews

In an effort to provide more efficient methods of control, evaluation, and reporting, reviews will be conducted of the RWP program and procedures utilized to minimize personnel exposure. Results of internal reviews will be reported to appropriate levels of station management. The Station ALARA Committee will review the results of special reviews or studies, and Radiation Protection will perform periodic self assessments to assist management in assuring that all aspects of the ALARA program are implemented.

12.5.3.2.1.6 Exposure Goals

On major dose accumulating job functions, total person-rem (TEDE) goals will be established prior to commencement of scheduled work. A general goal will be based on the previous dose performance on jobs of similar nature. A general goal of equaling or bettering the lowest total worktime expended on jobs of similar nature may be utilized when airborne concentrations or dose rates are unpredictable or subject to variations. These general goals may be modified if work tasks are not identical or estimated if there is no available historical data. Significant deviations above established goals will be investigated by Radiation Protection and/or the responsible supervisor. Methods to improve performance on future jobs will be investigated and implemented, if appropriate.

12.5.3.2.1.7 Job Planning

When applicable, tasks to be performed under the provisions of a RWP will be planned. The responsible supervisor will assure that individuals selected to perform the task are familiar with the appropriate procedures to be employed. Supervision will also assure that, when applicable, a tool list to include special tools that will reduce exposures is completed and reviewed. When practicable, the responsible supervisor will observe dry-run procedure performance. This training may be observed by a Radiation Protection representative to make time study records as an aid in estimation of person-rem or worktime goals. Special emphasis will be placed on job planning for work in high and very high radiation areas to maximize the use of temporary shielding, distance, and minimizing the work time.

12.5.3.2.1.8 Worker's Recommendations

An informal mechanism of soliciting worker recommendations for improvement of job efficiency will be utilized to evaluate alternative work methods. Supervisors will encourage workers to present alternatives that will reduce work time in radiation areas and airborne concentrations. Responsible supervisors may consult with Radiation Protection during or following evaluation of a recommended change to assure that individual and group exposures will not be adversely affected. Proposed changes in methods or equipment that are anticipated to improve efficiency and reduce exposure will be reviewed, and if approved, implemented in accordance with station procedures.

12.5.3.2.1.9 Federal and Administrative Dose Limits

Occupational doses will be maintained below the occupational dose limits specified in 10CFR20.1001 to 20.2401. Administrative limits will be implemented by station procedures to maintain personnel doses ALARA with respect to Federal Limits. Station dose limits may be exceeded only after appropriate level of approval. Unapproved exposure exceeding Station limits will be investigated by Radiation Protection to identify causes and establish methods to prevent recurrence.

12.5.3.2.2 External Exposure ALARA

12.5.3.2.2.1 Exposure Recording

Each RWP issued for entry into a radiation area will require each worker to wear at least one SRD or equivalent and one DLR. RWP sign-in sheets will be posted with the RWP, normally near the general work location. Each individual will assure required data is properly recorded on the RWP sign-in sheet. Electronic sign in/sign out may also be utilized.

12.5.3.2.2.2 Categorization of Exposures

Exposures incurred on RWP tasks will be categorized by work group and job function. To facilitate collation of data, scheduled work functions will be coded and entered on the RWP when applicable. In addition, plant system codes will be developed for RWP use. Whenever practicable, the equipment component number will also be recorded on the RWP. This system will allow an exposure history data base to be collected and thus permit supervisors and Radiation Protection personnel access to definitive records when planning RWP tasks.

12.5.3.2.2.3 Work Time Evaluation

Recording entry and exit times will allow total man hours spent on particular tasks to be tabulated. Under favorable conditions, a comparison of dose rate multiplied by man hours expended and measured dosimeter individual or group totals may be made to assure proper data entry and verify that no significant exposure rate changes occurred. The man hours expended will also be used as a data base to assist supervisory staff in planning work of similar nature.

12.5.3.2.2.4 Special Alarms and Instruments

The use of special alarms and instruments will be evaluated. Remote radiation monitors may be installed in the general work area to allow readouts in lower radiation areas. Portable survey instruments may be placed in the work area to allow workers to monitor changes in dose rate. Radiation dose rate meters and integrating devices with audible pre-set alarms may be used to warn workers of unexpected radiation levels or dose accumulation.

12.5.3.2.2.5 Temporary Shielding

During the planning phase of RWP work, supervision will evaluate the use of temporary shielding. Care will be taken to assure that installation and removal of shielding will not cause larger total person-rem than expected without its use. Every reasonable effort will be made to utilize temporary shielding, such as lead blankets, that can be quickly installed on initial entry and easily removed upon exit.

12.5.3.2.2.6 Special Tools and Apparatus

Every reasonable effort will be expended to assure special or modified tools are available for specific tasks. Available tools that will significantly reduce stay time in radiation areas and maximize distance from radioactive sources will be included on job procedure tool lists. Appropriate supervisors will review tasks to identify procedures that may be improved by modifications or replacement of tools and/or apparatus.

12.5.3.2.3 Internal Exposure ALARA

12.5.3.2.3.1 Engineering Controls

Preventing atmospheric contamination or reducing airborne concentrations to acceptable levels by utilizing practicable engineering or physical controls will assure that occupational doses are as low as reasonably achievable. Airborne concentrations will be minimized by appropriate use of enclosures or containment techniques, general and local ventilation, wetting of work surfaces, working underwater and other controls as available. Control and evaluation of airborne radioactivity is described in Subsection 12.5.3.5.

12.5.3.2.3.2 Respiratory Protection

When engineering controls are not practicable, or while they are being installed or repaired the use of respiratory protection will be evaluated. Respiratory protection may be utilized to minimize the intake of radioactive material. The respiratory protection fit testing and training program is described in Subsection 12.5.3.5.

12.5.3.2.3.3 Pre Work Air Surveys

When RWP requests indicate that work is required in airborne radioactive material concentrations, appropriate air samples will be taken. Any area that is posted as an Airborne Radioactivity Area will be sampled and analyzed prior to commencement of scheduled work. When existing airborne radioactive materials are not specifically identified, the Derived Air Concentration (DAC) for unidentified alpha and/or beta-gamma materials, as specified in applicable Radiation Protection procedures, will be used for scheduling, criteria for respiratory protection, and calculations and anticipated DAC-hours of exposure.

12.5.3.2.3.4 Special Air Sampling

When applicable, air samples will be taken with portable breathing zone (BZ) air samplers equipped with appropriate filter media during work in actual or potential elevated airborne radioactivity areas. The data from analyses of these air samples will be used to assist in future job planning and demonstrate that exposures are as low as reasonably achievable. Portable samplers are to be located as close as practicable to the breathing zone of workers.

12.5.3.2.3.5 Routine Air Sampling

Continuous air monitors will be placed in representative areas to sample airborne concentrations. These samplers will be periodically checked to verify proper function and assure that unexpected airborne concentration are detected at the earliest possible time. The air sampling program is described in Subsection 12.5.3.5.

12.5.3.2.3.6 Control of Area and Equipment Contamination Levels

Contaminated areas and equipment will be decontaminated to as low a level as practicable. Special emphasis will be placed on items that may be inadvertently touched by personnel and areas sufficiently contaminated so as to pose the potential for an airborne radioactive material. Supervisory staff will be responsible for assuring that work areas are maintained in a neat and orderly manner. The housekeeping practices employed will facilitate clean-up and decontamination efforts and thus minimize personnel stay time in radiation/contamination areas.

12.5.3.2.3.7 Airborne Exposure Evaluation

In accordance with station procedures, exposures to airborne radioactive material will be tabulated to aid in work planning to estimate internal doses and demonstrate the effectiveness of the internal ALARA program. When respiratory protection is employed, appropriate reductions of intake will be based on recommended protection factors. Subsection 12.5.3.5 describes the respiratory protection program.

12.5.3.3 Radiation Surveys

The Radiation Protection program will utilize a comprehensive system of radiation surveys to document plant radiological conditions and identify sources of radiation that contribute to occupational radiation exposure. The radiation survey program will be subject to evaluation by Radiation Protection supervision to assure that necessary data is collected while exposures to surveyors are as low as reasonably achievable.

12.5.3.3.1 Radiation Survey Program Controls

12.5.3.3.1.1 Record Review

A qualified member of Radiation Protection will review radiation survey records to assure that adequate readings are taken and properly recorded. If a need for additional data is noted, supervision will assure that such readings or supplemental surveys are taken and recorded. In addition, supervision will assure that unwarranted readings that contribute to time spent in radiation areas are not taken. If appropriate, Radiation Protection supervision will assure that proper corrective measures are taken.

12.5.3.3.1.2 Independent Reviews

To assure proper performance of job duties by surveyors, a member of Radiation Protection supervision will perform independent reviews which may include physical measurement of radiation levels in areas previously surveyed. Review data will be compared with survey records and posting and warning signs. The reviewer may accompany surveyors to observe and verify proper survey techniques. Deviations from approved Radiation Protection procedures or discrepancies in radiation measurements will be investigated and results reported to the Radiation Protection Manager or designated alternate. Appropriate corrective measures will be taken to prevent recurrence.

12.5.3.3.1.3 Surveyor Work Rotation

Every reasonable effort will be made to assure that surveyor exposure is evenly distributed by work assignment scheduling and rotation of Radiation Protection personnel. This rotation will allow comparison of surveyor performance, minimize individual exposures, and assure familiarity with all areas of the plant.

12.5.3.3.1.4 Training

Training of radiation workers will aid in the reduction of man-hours expended in radiation fields. All station personnel requiring Radiation Worker training as described in Subsection 12.5.3.7 will receive training in the types of radiation and methods of detection, self-survey and radiological surveys.

12.5.3.3.2 Radiation Survey Program

12.5.3.3.2.1 Instrument Selection

Radiation Protection procedures will describe the instrument type(s) to be utilized during radiation survey work. The surveyor will be required to enter instrument descriptions(s) and identification number(s) on survey forms. Prior to performing a radiation survey, the surveyor will check the calibration status of the portable instrument(s) selected for use to ensure the calibration is current and consistent with approved Station procedures. The instrument selected will be checked for battery strength, if applicable, and, in a reproducible geometry, at least one scale's response to known check source(s) will be verified. Instruments overdue for calibration, with weak batteries, failing the check source or response test, or exhibiting other signs of malfunction will not be used for radiation survey work. Personnel will be instructed to report suspected malfunctions of instrumentation. A properly checked replacement or equivalent survey instrument will be utilized.

12.5.3.3.2.2 Routine Radiation Area Surveys

Each area on site accessible to individuals in which radiation levels could result in an individual receiving a dose in excess of 5 mrem in one hour at 30cm will be conspicuously posted as a Radiation Area in accordance with 10CFR20.1902(a). Every reasonable effort will be made to minimize inadvertent entries in such areas. The "Caution Radiation Area" signs posted at the boundaries will be evaluated to ensure signs reflect current conditions. Whenever practicable, the area postings will also reflect the general and maximum radiation levels within the area and any special conditions required for entry. Radiation areas will be surveyed at a frequency dictated by occupancy and radiological conditions as detailed in Station procedures. Areas subject to variations in radiation levels or increased time of occupancy may be surveyed on a more frequent basis, as appropriate. When reactor conditions are operationally stable, survey frequency in radiation areas may be reduced to spot checks at the boundaries to minimize Radiation Protection personnel exposures.

12.5.3.3.2.3 High Radiation Area Surveys

Each area on site accessible to individuals in which radiation levels could result in an individual receiving a dose in excess of 100 mrem in one hour at 30cm will be conspicuously posted "Caution (Danger) High Radiation Area" in accordance with 10CFR20.1902(b) and access will be controlled in accordance with Subsection 12.5.3.1. Routine surveys within such areas will not normally be performed with conventional portable survey instruments. Readings from the Area Radiation Monitoring (ARM) System may be used to identify changes of radiation levels. Analyses of maximum and general radiation levels within high radiation areas will normally be performed with remote probe survey instruments, long reach survey instruments or retrievable dosimeters. When practicable, findings from these surveys will be correlated to the appropriate reactor operating conditions. Correlation readings, perimeter readings, or readings prior to or at the time of entry by Radiation Protection will assure that each high radiation area is adequately surveyed. In addition, radiation surveys will be taken at the entrances to high radiation areas on a frequency dependent upon occupancy in the vicinity and variation in radiation levels. Signs will be evaluated to ensure current conditions are reflected. If surveys at entrances or ARM readings show significant change, additional surveys may be performed to update the readings within the area. In order to minimize occupational exposure of surveyors, high radiation area survey frequency may be reduced when operating conditions are stable.

12.5.3.3.2.4 Very High Radiation Area Surveys

Each area on site accessible to individuals in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads in 1 hour at 1 meter from a radiation source or any surface that the radiation penetrates will be conspicuously posted "Grave Danger, Very High Radiation Area" in accordance with 10CFR20.1902(c), and access will be controlled in accordance with Subsection 12.5.3.1. These areas will be surveyed only when access is required. Readings from the Area Radiation Monitoring (ARM) System may be used to identify changes in radiation levels.

12.5.3.3.2.5 Non-Radiation Area Surveys

Areas in and around the Radiologically Controlled Area not considered potential radiation areas will be selectively surveyed to establish that every reasonable effort has been made to keep measurable radiation levels as low as reasonably achievable. Portable instrument surveys will be performed so as to assure a representative number of non-radiation areas are surveyed on a routine basis. Areas subject to significant change or variation will be surveyed on a more frequent basis as appropriate. Any area, not previously noted, that is found to be a radiation, high radiation or very high radiation area will be promptly and appropriately posted and reported to Radiation Protection supervision. If the radiation dose rate cannot be eliminated, every reasonable effort will be made to minimize the dose rate and inadvertent entry.

Areas within Susquehanna SES security fence not covered by portable instrument survey programs will be selectively monitored by area dosimeters to document integrated exposures. Area dosimeters will normally be changed and evaluated on a routine basis.

12.5.3.3.2.6 Radiation Work Permit Surveys

Surveys required in support of RWPs and pre-job planning will be performed in accordance with approved Station procedures.

12.5.3.3.2.7 Special Radiation Surveys

Special radiation surveys will be performed as requested by operating groups, regulatory agencies, or corporate committees. These survey requests will be coordinated by Radiation Protection supervision to assure the need for the survey justifies occupational exposure of surveyors. A member of Radiation Protection supervision may draft special instructions for performance of the survey and/or perform impromptu training sessions with surveyors. Emphasis will be placed on assuring that necessary data is collected in the minimum of time. Individual and person-rem exposure incurred during special surveys will be logged by job function, equipment and/or system.

12.5.3.3.2.8 Radiation Survey Records

Radiation surveys performed at Susquehanna SES will be documented in accordance with approved station procedures. A member of Radiation Protection will review the record(s) completed by surveyors to assure proper data entry. The reviewer will sign and date the record and forward it for permanent filing.

12.5.3.4 Contamination Survey Procedures

A system of contamination evaluation will be utilized to minimize the spread of radioactive material. Evaluation of personnel, equipment and surface contamination will also be made to demonstrate the efficiency of engineering and procedural controls. In addition, the contamination survey programs will be evaluated to assure that surveyor exposures are ALARA.

12.5.3.4.1 Personnel Contamination Surveys

Evaluation of exposures due to personnel contamination will be conducted in accordance with Subsection 12.5.3.6.

12.5.3.4.1.1 Frisker Survey

Personnel contamination monitors/friskers will be placed in strategic locations within the Radiologically Controlled Area. Every effort will be made to locate these instruments in as low a radiation background area as possible in order to maximize sensitivity. Personnel will be trained in the use of the instrument(s) and interpretation of the readings.

In the event of frisker malfunction, personnel will be required to notify Radiation Protection. Audible or visible alarms will be preset at a suitable point above background to minimize spurious alarms and maximize sensitivity.

Personnel contamination causing frisker alarm will require notification of Radiation Protection. Radiation Protection will take appropriate actions to minimize further spread of contamination, and direct appropriate decontamination of affected areas and personnel.

When personnel contamination is noted, a Radiation Protection investigation appropriate to the incident will be performed.

12.5.3.4.1.2 Nasal Swab

Nasal swabbing will be implemented as requested by Radiation Protection or when contamination exceeding station limits is detected on facial areas to qualitatively determine if inhalation of radioactive material occurred. Radiation Protection personnel will evaluate the swab as soon as practicable. Findings in excess of Station limits will require a bioassay.

12.5.3.4.1.3 Intake Procedures

If facial contamination is detected in excess of Station limits a bioassay will be performed. Station limits and action levels will be contained in approved Station procedures to ensure adequate investigations, evaluations, management notification and corrective actions are taken.

12.5.3.4.1.4 Wound, Cut, Abrasion Surveys

To control inadvertent entry of radioactive material in wounds, cuts or abrasions, individuals will be responsible for bringing such matters to the attention of supervisors and/or Radiation Protection prior to work commencement. Supervisory personnel will assure that reported skin breaks are brought to the attention of the Radiation Protection group during job planning or RWP request. Open wounds that cannot be adequately sealed will be sufficient grounds to restrict the worker from work in contaminated areas.

Any injury that may have caused contamination of a wound will require the worker to immediately exit the work area and report the incident to Radiation Protection and appropriate supervision. The wound will be surveyed with portable instrumentation. If contamination is detected in the wound and injury is sufficient to prevent the worker from moving or exiting the area, whole body counts and/or bioassays will be taken following any needed medical treatment.

12.5.3.4.2 Equipment Contamination Surveys

12.5.3.4.2.1 Contaminated Area Equipment Surveys

Movement of equipment from a contaminated area will require notification of Radiation Protection personnel. Fixed and removable contamination levels will be evaluated as appropriate in accordance with Station procedures.

Routinely used tools may be permanently marked to indicate they are contaminated and will be stored inside approved areas. Repair or use of contaminated tools (smearable) outside contaminated areas will require Radiation Protection approval. Permanently marked tools will be surveyed by Radiation Protection personnel as necessary and at the request of the appropriate supervisor. Contaminated items that cannot practicably be decontaminated to remove smearable contamination will be covered with plastic or other material and appropriately labeled.

12.5.3.4.2.2 Personal Item Monitoring

Station procedures will require that individuals leaving a contaminated area perform monitoring of personal items that may have become contaminated during work. Items such as dosimeters, badge holders, pens and pencils, will be scanned with contamination monitor/friskers. Contamination noted on such items will be reported to Radiation Protection personnel. Additional monitoring will be performed and the items decontaminated or discarded as radioactive waste as appropriate.

12.5.3.4.2.3 Protective Clothing Surveys

Reusable protective clothing and shoe covers used in contaminated areas will be collected in receptacles at step-off areas and sent for laundering/decontamination. Protective clothing that is shipped offsite for laundering will be prepared for shipment and labeled in accordance with applicable U.S. Department of Transportation (USDOT) regulations. Records of survey results will be maintained for each shipment.

12.5.3.4.2.4 Respiratory Protection Device Surveys

Decontaminated and sanitized masks will be checked for removable and fixed contamination levels prior to storage and/or reissue.

12.5.3.4.2.5 Surveys Involving Receipt/Shipment of Radioactive Material

The Radiation Protection Manager or designated alternate will be notified upon arrival of shipments of radioactive material. Shipping containers will be monitored for radiation and/or contamination in accordance with 10CFR20.1906. Whenever practicable, the container will be monitored prior to removal from the vehicle. If removable contamination or radiation levels are found to exceed the limits of 10CFR20.1906, the Site Vice President/Plant Manager-Nuclear or designated alternate will notify the final delivering carrier, the shipper, and the Nuclear Regulatory Commission (NRC) Inspection and Enforcement Regional Office.

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When applicable, Radiation Protection supervision will assure that, prior to leaving the site, exclusive use transport vehicle surface contamination and radiation levels are within limits specified in 49CFR173.

Station procedures will specify special procedures and precautions to be taken when opening packages containing licensed material, including instructions pertaining to specific types of shipments normally received at Susquehanna SES.

Radioactive material will be shipped in accordance with USDOT and NRC regulations. Station procedures will implement the applicable regulations with regard to proper packaging and labeling requirements. Appropriate removable contamination and exposure rate surveys will be taken, records completed, and shipments labeled accordingly.

12.5.3.4.3 Surface Contamination Surveys

12.5.3.4.3.1 Radiologically Controlled Area (RCA)

A smear survey program will be developed and implemented to assure that a representative number of routinely accessible surface areas within the RCA are checked for removable contamination. Special emphasis will be placed on a survey of the clean side of established contaminated area step-off areas. Smears will be analyzed on appropriate counting equipment and records of results will be maintained. If results indicate removable contamination exceeding station limits, the area will be designated as a contaminated area. The area will be decontaminated and resurveyed if practicable and ALARA. Applicable area signs, barriers, or boundary markers will be employed when surveys indicate that removable contamination is above station limits.

12.5.3.4.3.2 Non-Radiologically Controlled Areas

Occupied plant areas outside the RCA will be surveyed to assure that a representative number of floor surfaces are checked for removable contamination. The exit areas from the RCA will receive special emphasis to minimize the spread of contamination. Smear survey, analyses and record keeping techniques will be as described above. Non-RCA areas found to have removable contamination levels exceeding Station limits will be designated as a contaminated area until decontaminated and resurveyed.

12.5.3.4.3.3 Implementation, Review, and Reporting Practices

Contamination limits, general survey locations and survey frequencies will be specified in Susquehanna SES Radiation Protection Procedures. Procedures will be subject to review by Radiation Protection supervision to assure contamination survey implementation is responsive to plant status.

A member of Radiation Protection will review records of contamination survey results to assure proper completion and adequate survey. In the event of contamination in excess of Station limits, a member of Radiation Protection supervision will be responsible for assuring that corrective measures are implemented and that further reports through appropriate channels are initiated if required.

12.5.3.5 Airborne Radioactive Material

Every reasonable effort will be expended to minimize airborne concentrations within the plant. A sampling and analysis program will be utilized to determine airborne concentrations in routinely occupied areas. These routine measurements as well as engineering controls, special surveys, respiratory protection procedures and administrative procedures will be implemented to minimize airborne contamination.

12.5.3.5.1 Physical Controls

12.5.3.5.1.1 Air Flow Patterns

Air flow patterns are directed toward areas of higher actual or expected, airborne concentrations. Appropriate measures will be taken if flow patterns are found to be unacceptable as compared to design basis.

12.5.3.5.1.2 Contamination Confinement

Contaminated items will be properly confined to prevent inadvertent airborne contamination. Such items will be sealed in appropriate material or stored in ventilated areas whenever practicable. When necessary, alternatives such as temporary tents or enclosures, storage in rooms or areas where air movement is away from occupied areas, or wetting or fixing of the contamination may be utilized to minimize airborne concentrations.

12.5.3.5.1.3 Air Exhaust

Exhaust of areas or items where airborne concentrations may be generated will be employed whenever practicable. Contaminated trash sorting areas, trash compactors, fume hoods, and sampling stations are typical locations where air exhaust will be utilized. Exhaust flow rates or face velocities on such equipment will be verified periodically and after ventilation modifications to assure proper function. Items that may contain highly contaminated materials such as trash compactors or chemistry fume hoods will be equipped with a visual indicator or alarm to warn individuals upon loss of exhaust flow. Portable exhaust fans will be directly discharged to building exhaust whenever practicable. When discharge to building exhaust is not practicable the portable exhaust fan will be filtered to minimize airborne concentrations.

12.5.3.5.1.4 Posting and Locking

Accessible areas containing airborne concentrations exceeding the limits specified in 10CFR20.1902(d) will be posted with a "Caution - Airborne Radioactivity Area" sign. Whenever practicable, access points to such areas will be barricaded to reduce the risk of inadvertent entry.

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12.5.3.5.2 Administrative Controls

12.5.3.5.2.1 Radiation Protection Review

Posted airborne radioactivity areas will be reviewed by Radiation Protection supervision in accordance with Station procedures. Methods to reduce existing airborne concentrations will be forwarded through appropriate channels for review, approval, and implementation. During the review, Radiation Protection supervision will assure that every reasonable effort has been expended to reduce the risk of inadvertent entry in airborne radioactivity areas.

12.5.3.5.2.2 Radiation Protection Investigation

When an occurrence produces unanticipated high airborne concentrations in occupied areas, Radiation Protection supervision will assure that an investigation appropriate to the incident is completed. The first priority will be evaluation and follow-up of personnel intake of radioactive material if applicable. The second portion of investigation will emphasize determination of the cause of the release. Recommendations to prevent recurrence will be forwarded through appropriate channels for implementation.

12.5.3.5.2.3 RWP Procedures

Radiation Work Permit procedures, as described in Subsection 12.5.3.2, will be a primary administrative control of exposure to airborne radioactive material. Radiation Protection review prior to approval will assure that every reasonable effort is expended to minimize the production of, or reduce existing, airborne concentrations before work commencement.

12.5.3.5.3 Air Sampling Equipment

A description of the use, calibration methods and frequencies of specific air sampling equipment utilized at Susquehanna SES is contained in Subsection 12.5.2.

12.5.3.5.4 Airborne Concentration Sampling

12.5.3.5.4.1 Routine Sampling

Routine sampling in selected areas of potential airborne concentrations will be accomplished with continuous air monitors (CAM) or portable air samplers. CAM sampling media and detector will be selected as appropriate to the intended use of the device. CAMs will be routinely checked for proper operation. Abnormal readings or equipment malfunction will be reported through appropriate channels for investigation and/or repair. Alarms, if applicable, will be checked for operability during source check and calibration procedures. Fixed filter devices will be changed on a frequency specified by Radiation Protection procedures to assure optimum sampling time, meaningful results, and proper equipment operation.

12.5.3.5.4.2 Special Air Sampling

Records will be maintained to reflect the reason for the special surveys, device(s) used, and final results. The majority of special air samples will be taken as the result of Radiation Work Permit requirements and recommendations.

12.5.3.5.5 Air Sample Evaluation

12.5.3.5.5.1 Particulate Initial Evaluation

After the completion of sampling, filters will be counted following collection. Results will be recorded on an analysis form.

12.5.3.5.5.2 Subsequent Particulate Evaluations

Samples exceeding Station limits for initial gross counts will be analyzed for actual DAC value based on gamma spectroscopy or unidentified values.

12.5.3.5.5.3 Gaseous Evaluations

Airborne radioiodine samples will normally be collected on charcoal canisters or cartridges, and analyzed on an appropriate system.

Airborne tritium samples will normally be collected in water bubblers or desiccant columns, and analyzed on an appropriate system.

Noble gases will be collected and analyzed with an appropriate system to identify isotopes.

12.5.3.5.6 Respiratory Protection

When engineering or physical controls are not practicable, the respiratory protection program will assure that personnel intake of radioactive material is minimized. The respiratory protection program will not be used in place of practicable engineering controls and prudent radiation safety practices. Every reasonable effort will be expended to prevent potential as well as minimizing existing airborne concentrations. When controls are not practicable, or conditions unpredictable, respiratory protective devices may be utilized to reduce intake of airborne radioactive material to levels which are ALARA.

The Susquehanna SES Respiratory Protection Program will ensure that the following minimum criteria are met: written standard operating procedures; proper selection of equipment, based on the hazard; proper training and instruction of users; proper fitting, use, cleaning, storage, inspection, quality assurance, and maintenance of equipment; appropriate surveillance of work area conditions, consideration of the degree of employee exposure to stress; regular inspection and evaluation to determine the continued program effectiveness; program responsibility vested in one qualified individual and an adequate medical surveillance program for respiratory users.

12.5.3.5.6.1 Training and Fitting

The training program is described in Subsection 12.5.3.7. Individuals will be required to don the device(s) that may be used, perform appropriate pressure tests for leak detection, and quantitatively be laser photometry tested using a system for adequate fit of the respiratory protective device. If leakage exceeds the devices rated protection factor and retests confirm this, the individual will not be approved to use the device. If quantitative testing is not practicable or unavailable, qualitative tests such as irritant smoke or isoamyl acetate may be used as a challenge atmosphere. Detection of odor will be considered a fitting failure. After successful completion of training and fitting programs, appropriate records will be maintained to assure individuals are issued only the approved type and model of protective device(s). These records will reflect expiration dates.

12.5.3.5.6.2 Written Procedures

The Respiratory Protection Program and program responsibility will be implemented by Radiation Protection approved procedures. Applicable Radiation Protection procedures will include as a minimum: description of equipment, information regarding issuance, fitting, survey, selection, use, inspection and testing. Station procedures will specify cleaning, decontamination, maintenance and sanitizing requirements.

12.5.3.5.6.3 Selection of Equipment

The need for respiratory protection will be determined by Radiation Protection personnel after evaluation of appropriate engineering controls. Airborne concentrations will be determined by air sampling methods described in this section. The hazard will be evaluated and applicable respiratory protection prescribed in accordance with the RWP evaluation, review, approval and implementation process and ALARA programs as described in Subsection 12.5.3.2.

12.5.3.5.6.4 Issue and Use

For normal work situations, respirators will be issued after approval of a Radiation Work Permit. Qualification lists will be utilized to assure only the specific models approved for the worker are issued. After issuance, the worker will be responsible for proper use and deposition of the device.

12.5.3.5.6.5 Cleaning, Decontamination, Inspection, Maintenance, Sanitizing and Storage

In no case will a respirator be issued to another individual prior to cleaning survey, inspection and sanitizing. Respiratory face pieces will be washed, sanitized, dried, surveyed for removable and fixed contamination levels, inspected and stored in accordance with procedures approved by Radiation Protection. Inspection of masks will emphasize identification of defects at critical points, proper function of attached fittings and valves, and proper shape of face-piece. Simple maintenance and repair will be performed as necessary. Maintenance and repair of regulators will be performed only by specially trained and qualified individuals. Masks ready for reissue will be stored in Radiation Protection approved manner and locations. Every effort will be made to assure proper storage of masks to prevent deformation of face piece parts.

12.5.3.5.6.6 Quality Controls

Inspection and testing of new equipment will be implemented to detect instances of human error or defective materials in the manufacture and assembly of the devices.

Respiratory protection devices will be routinely inspected after cleaning and maintenance. The inspection will be performed to detect any damage or defects caused by cleaning or wear. A representative portion of the available devices may also be tested. Testing will normally consist of a positive or negative pressure leak detection test or exposure to a challenge atmosphere when maintenance activities may have affected the performance of the respirator.

12.5.3.5.6.7 Surveillance of Work Area Conditions

For work conditions involving respiratory protection, air sampling surveillance will provide an estimate of the potential intake of airborne radioactive materials and resulting exposure of the individual worker. This indicates the continuing effectiveness of existing controls, and warns of the deterioration of control equipment or operating procedures.

The periods of time respirators are worn continuously and the overall durations of use will be kept to a minimum by procedural controls in appropriate work instructions and work surveillance by work group personnel. Workers will be instructed that they may leave areas where respirator use is required for relief in case of equipment malfunction, undue physical or psychological distress, procedural or communication failure, significant deterioration of operational conditions, or any other condition that might require such relief.

12.5.3.5.6.8 Evaluation of Program Effectiveness

Respirator failures, evidence of respiratory leakage, and equipment problems encountered will be investigated by Radiation Protection. Problems will be solicited from respirator users during activities such as plant safety meetings and training sessions. Proposed changes to prevent recurrent problems or improve efficiency of the program will be forwarded through appropriate channels for review, approval and implementation.

The effectiveness of the respiratory protection program will be evaluated by the correlation of bioassay results with air sampling results. Evidence of unanticipated exposure levels attributable to inhalation will be investigated.

12.5.3.5.6.9 Medical Surveillance

Prior to participation in the Susquehanna SES Respiratory Protection Program, individuals will be evaluated by licensed medical personnel to ensure they are physically and mentally able to wear respirators under anticipated working conditions.

Individuals involved in the respiratory protection program will also be re-evaluated as part of their routine company physical with respect to physiological and psychological factors affecting respirator use.

Details of the medical surveillance program are specified in appropriate Nuclear Department procedures.

12.5.3.5.7 Handling of Radioactive Material

12.5.3.5.7.1 Unsealed Material

Radioactive material in liquid form will be stored in sealed or vented/exhausted containers whenever practicable. When containers are opened to atmosphere and generation of airborne contamination is possible, they will be opened in fume hoods, exhausted areas, or in locations where air movement is away from workers' breathing zones. Whenever practicable, liquid radioactive material will be transported in unbreakable containers or in a secondary container to collect material in case of breakage.

Gaseous radioactive material will be similarly stored and opened. Transport of gaseous samples will be done in sealed, gas tight containers.

Solid articles that are sufficiently contaminated with particulate and/or volatile material so as to pose a potential airborne hazard will be handled and stored as described in Subsection 12.5.3.5.1.2. Radioactive material and storage of radioactive material are controlled by the Radiation Protection Program.

Protective clothing, respiratory protection, and special precautions will be specified by Radiation Protection procedures, training and/or Radiation Work Permit for handling unsealed material.

12.5.3.5.7.2 Sealed Materials

Sources will be stored in appropriate shielded containers when not in use. Containers will be labeled in accordance with 10CFR20.1904 to reflect contents and radiation levels. When stored in an unrestricted area, licensed sources will be secured inside containers or containers will be secured in a storage location when not in use. When sources produce a whole body or contact radiation dose rate greater than limits established by Station procedures, a Radiation Work Permit will be completed and approved prior to use. Remote devices such as forceps, tongs or manipulators will be used whenever practicable or required by Radiation Work Permit.

Licensed sealed sources will be monitored for leakage to assure that storage or use is not causing the spread of contamination or airborne radioactive material. When monitoring of the source capsule is not practicable, removable contamination surveys will be performed at places on the container or source holder where contamination might be expected to accumulate if the source were leaking. Samples will be analyzed on counting equipment appropriate to the source material and records of results maintained. Frequency, materials to be tested and record keeping requirements of NRC license or Technical Specifications will be implemented by Radiation Protection procedures. Sealed sources found to be leaking will be sealed from atmosphere whenever practicable and/or stored in ventilated areas until disposal or repair.

12.5.3.6 Personnel Monitoring

12.5.3.6.1 External Personnel Monitoring

Personnel monitoring devices will be used at Susquehanna SES to evaluate external occupational exposure to radiation sources. Exposure information will be used for work function exposure evaluation, job planning, reporting requirements, incident analysis, and an indication of the effectiveness of ALARA practices.

12.5.3.6.1.1 Personnel Dosimetry Evaluation

Routinely used personnel dosimetry will include self-reading dosimeters, electronic dosimeters and DLRs. Individuals requiring personnel dosimetry will be instructed in the purpose and use of the devices, station administrative dose limits, and interpretation of self-reading dosimeter readings. Appropriate dosimetry devices will be issued in accordance with station procedures implementing 10CFR20.1502.

Dosimetry will normally be worn on the front of the body between the neck and the waist. When appropriate, dosimetry will be issued and worn on the extremities and/or multiple locations on the body. Dosimetry may be wrapped in plastic to prevent the contamination of personnel monitoring devices when entering contaminated areas.

As described in Subsection 12.5.3.2, self-reading dosimeter results will be used for specific ALARA job dose evaluation as well as to indicate current individual dose status. Dosimeters of appropriate ranges will be available for use during work in radiation, high radiation and very high radiation areas. Radiation workers will be responsible for checking their dosimeter readings when working in RWP areas. The frequency of dosimeter checking will depend upon the nature of the job and dose rates, and will be discussed with the radiation workers during RWP pre-job planning. Off-scale or malfunctioning dosimeters will be reported to Radiation Protection. Radiation Protection personnel will then evaluate the occurrence. Dosimeters will be removed from service if test results exceed operational acceptance criteria specified in the Station Radiation Protection procedures.

Self-reading and electronic dosimeters will normally be used to monitor gamma exposure only. They may be used to determine neutron dose equivalent in a mixed radiation field provided the neutron dose equivalent rate and gamma exposure rate at the point of personnel exposure are known from separately made determinations; and the neutron-to-gamma ratio is essentially constant during the period of personnel exposure. Methods of evaluation of dosimeter readings to determine neutron dose equivalent will be specified in Station Radiation Protection procedures. When neutron dose equivalent is determined from self-reading dosimeters, it will be added to the whole body gamma deep dose equivalent.

DLRs will normally be used to determine the record dose. Personnel DLRs will be evaluated no less frequently than the characteristics of the DLR allow with a limit of twelve months. For frequencies greater than three months, a fade study shall be performed and documented to demonstrate acceptable DLR performance. The data obtained from DLRs will be evaluated to determine dose equivalence. Deep dose equivalent readings indicate the dose equivalent at 1000 mg/cm² to be attributed to whole body. Appropriate correction and quality factors will be applied to neutron readings to determine the neutron dose equivalent. Neutron and gamma doses will normally be added together to yield the whole body dose equivalent. If DLRs are utilized for determining neutron dose equivalents appropriate correction factors will be applied. The shallow dose equivalent at 7 mg/cm² will determine the skin dose equivalent. When appropriate, the shallow dose determined by issued extremity monitoring devices, will determine the extremity dose equivalent.

Eye dose equivalent readings at 300 mg/cm² indicate the dose equivalent to be attributed to the lens of the eye.

Personnel doses will be tabulated and compared to applicable station and federal limits by Radiation Protection personnel.

12.5.3.6.1.2 Administrative Exposure Control

Administrative exposure limits will be established and implemented by Radiation Protection procedures to assure the limits of 10CFR20.1201 are not exceeded and personnel occupational doses are maintained ALARA.

12.5.3.6.1.3 Methods of Recording and Reporting

Designated supervisors will receive reports of their employees' accumulated doses for use in RWP job planning and scheduling. Unapproved doses exceeding Station limits will be reported to the appropriate supervision as required by procedures, and investigated by Radiation Protection to identify causes and establish methods to prevent recurrence.

When NRC-4 Forms are being completed in accordance with 10CFR20.2104, occupational radiation exposure for the current year received during previous employment will be used. Records used in preparing Form NRC-4, or equivalent, will be retained and preserved until the NRC authorizes disposition. Records of the radiation dose of all individuals issued personnel dosimetry in accordance with 10CFR20.1502 will be maintained on Form NRC-5, or equivalent. Records of radiation dose received during employment at Susquehanna SES will be maintained indefinitely or until NRC authorizes disposal.

Reports of exposure to radiation or radioactive materials will be made to individuals as specified in 10CFR19.13. When reports of individual dose to radiation or radioactive material are made to the NRC, the individual(s) concerned will also be notified. This notice will be forwarded to the individual(s) at a time no later than the transmittal to the Commission and will comply with 10CFR19.13.

An annual report of the results of individual monitoring for each individual for whom monitoring was required while employed or working at Susquehanna SES will be furnished to the NRC in accordance with 10CFR20.2206 and to the individual annually or upon termination of employment or work assignment at Susquehanna SES.

In the event of an exposure in excess of 10CFR20.1201 limits, Radiation Protection supervision will investigate the event and document the description of the occurrence; conditions under which the exposure occurred; names of personnel involved and amount of dose received; action taken at time of occurrence; recommendations for corrective measures and means of implementation to prevent a similar occurrence.

Reports of overexposures at Susquehanna SES will be submitted to the NRC and the individual(s) involved in accordance with 10CFR19.13 and 10CFR20.2203. Reports will also be forwarded to appropriate committees for review and commendation for follow-up action.

12.5.3.6.2 Internal Radiation Dose Assessment

When engineering controls are impracticable and airborne concentrations exceed station limits, trained individuals will be equipped with properly fitted respirators. Internal exposure evaluation will be utilized to determine the effectiveness of the Respiratory Protection Program and evaluate suspected intake of radioactive material. The Respiratory Protection Program is described in Subsection 12.5.3.5. Bioassay techniques will be used to assess Committed Effective Dose Equivalent (CEDE) and Committed Dose Equivalent (CDE) from intakes of radioactive material.

12.5.3.6.2.1 Bioassay Methods

Passive internal exposure monitoring is performed to determine the presence of radioactive material in the body using gamma-sensitive monitors. When required, whole body counting will be used to qualitatively and quantitatively identify radionuclides deposited in the body which emit penetrating radiations. Depending upon the physical construction and geometry of the whole body counter, sensitivity of the detector(s), and biological factors, concentrations of radionuclides may be detected in the whole body, thyroid, lung, G.I. tract, or wounds. The whole body counter will be set up and calibrated and/or utilized in accordance with Subsection 12.5.2. Calculation of CEDE and CDE will be based on physiological retention. Gamma-sensitive monitors will be calibrated in accordance with station procedures, using the appropriate gamma emitting sources.

Urine analysis may be conducted to identify the presence of radionuclides in extracellular body fluids. Under favorable circumstances, with a full 24-hour sample and further analyses, the amount of radionuclides may be qualitatively and quantitatively determined. Results may be utilized to substantiate in vivo analyses findings. Calculation of CEDE and CDE will be based on physiological excretion.

Fecal analysis may be used in accordance with station procedures to evaluate intake of non-transportable (i.e., insoluble) material and provide evidence of the clearance of such material from the lungs. When it is suspected that a non-transportable radionuclide has been inhaled, the total amount excreted in feces during the succeeding few days may be used to estimate the amount initially deposited in the lungs. Standard lung models recommended by International Commission on Radiological Protection (ICRP) may then be used to evaluate the amount inhaled. Calculation of CEDE and CDE will be based on physiological excretion.

Dose equivalent for internally deposited radionuclides may be estimated by calculating the amount of airborne radioactive material inhaled, based on airborne radioactive material measurements, exposure times, standard lung models and breathing rates.

12.5.3.6.2.2 Administrative Controls

Records, approved station procedures, program reviews, and investigation will assure proper administrative control over the internal personnel monitoring program. Reviews of the internal personnel monitoring program and investigations of individual cases of suspected or known intakes will be performed and documented by Radiation Protection supervision.

12.5.3.6.2.3 Criteria for Participation or Selection

Selection of personnel and frequency of routine whole body counting and bioassay analyses will be implemented by Radiation Protection procedures.

Guidelines for participation in special whole body counting and/or bioassay analyses will be developed and contained in approved Station procedures.

Guidelines for selection of personnel for special, non-routine urine analysis will be developed and contained in approved Station procedures.

12.5.3.6.2.4 Evaluation and Reporting

Internal doses will be evaluated against the criteria of 10CFR20.1201 assuming conservative conditions and time frames with respect to the time of intake. Reports of overexposure will be completed and submitted to the NRC when occupational dose limits specified in 10CFR20.1201 have been exceeded.

12.5.3.7 Radiation Protection Training Programs

Radiation Protection Training Programs will assure that personnel, who have unescorted access to the restricted area, possess an adequate understanding of radiation protection to maintain occupational radiation exposures as ALARA. Special training/retraining will be administered upon recommendation of the Site Vice President/Plant Manager-Nuclear or Radiation Protection Manager. Record keeping and training scheduling will be performed by the Nuclear Training Group.

12.5.3.7.1 Program Controls

12.5.3.7.1.1 Radiation Protection Training Program Review

Radiation Protection Training Programs will be reviewed by Radiation Protection Supervision and/or pertinent committees to assure implementation of ALARA philosophy. Recommendations for improvements to training programs will be forwarded through appropriate channels for review, approval, and implementation.

12.5.3.7.1.2 Access Control

An access control list will be compiled and maintained. The list will specify personnel qualified for unescorted access to the Restricted Area by having met the requirements of appropriate level of Radiation Protection Training in accordance with Station procedures. A listing specifying individuals' retraining dates will be maintained.

12.5.3.7.1.3 Retraining/Replacement Training

To assure a high level of individual proficiency in radiation protection practices, radiological protection retraining and refreshing frequencies will be determined jointly by the Manager-Nuclear Training and the Radiation Protection Manager. Scheduling, records, and test results will be maintained by the Nuclear Training Group. Individuals changing job classification will receive training of the level required by their new job classification.

12.5.3.7.2 Training Programs

12.5.3.7.2.1 Plant Access Training

All persons allowed unescorted access into the restricted area as a minimum, receive Plant Access Training. To be qualified for plant access, an individual will demonstrate proficiency in the following areas as evidenced by passing a written examination:

Biological Effects and Risks

Basic Terminology

Background Radiation

Radiological Control Signs and Posting Requirements

Prenatal Radiation Exposure

Completion of Radiation Worker Training meets the requirements for Plant Access Training.

12.5.3.7.2.2 Radiation Worker Training

Radiation Worker Training will normally be administered to individuals who require unescorted access into the Radiologically Controlled Area. Radiation Worker Training will be administered to provide radiation workers with an adequate knowledge to effectively cope with job situations while maintaining radiation exposures ALARA. Upon completion of initial Radiation Protection Training, the individual will complete a practical exercise which demonstrates the ability to wear protective clothing, enter a radiologically contaminated area, remove tools, and exit the radiological area. The individual will demonstrate proficiency in the following areas as evidenced by passing a written examination:

- Source of Radiation
- Types and Measurement of Radiation
- Biological Effects of Radiation
- SSES Guidelines and Federal Limits on Radiation Dose
- ALARA (methods to minimize radiation exposure)
- Radiation Dosimetry
- Contamination and Internal Exposure
- Radiation Work Permits
- Postings and Radiological Alarms
- Radioactive Waste
- Rights and Responsibilities
- Requirements of 10CFR19.12

12.5.3.7.2.3 Respiratory Protection Training

Individuals and their supervisors requiring access to areas where respiratory protection will be utilized will complete the Respiratory Protection Training Program. The instructor will be a qualified individual with knowledge and experience regarding the application and use of respiratory protective equipment and the hazards associated with radioactive airborne contaminants.

Training will include lectures, demonstrations, and discussions of pertinent Station procedures. The program will include as a minimum: discussion of the airborne contaminants against which the wearer is to be protected, including their physical properties, DACs, physiological action, toxicity, and means of detection; discussion of the construction, operating principles, and limitations of the respiratory equipment and the reasons the respirator is the proper type for the particular purpose; discussion of the reasons for using the respirators and an explanation of why more positive control is not immediately feasible, including recognition that every reasonable effort is being made to reduce or eliminate the need for respirators; instruction in procedures for ensuring that the respirator is in proper working condition; instruction in fitting the respirator properly and checking adequacy of fit; instruction in the proper use and maintenance of the respirator; discussion of the application of various cartridges and canisters available for air-purifying respirators; instruction in emergency action to be taken in the event of malfunction of the respiratory protective devices; review of radiation and contamination hazards, including the use of other protective equipment that may be used with respirators; classroom and field training to recognize and cope with emergency situations; and other special training as needed for special use. Individuals will receive retraining on an annual basis. Records of this training will be maintained by the Nuclear training group.

12.5.3.7.2.4 Radiation Protection Technician Initial Training Program

A Radiation Protection Training Program will be administered to applicants for the position of Radiation Protection Technician under the direction of the Radiation Protection Manager or designated alternate. The content of instruction will depend upon the experience and qualifications of the applicant with course content outlined in approved Nuclear Training procedures. Applicants with Radiation Protection experience may be waived from participation in part or all of the initial technician training program. All applicants must demonstrate their proficiency by successfully completing a technician qualifications examination.

The initial training program will cover a period of approximately one (1) year for the applicant lacking Radiation Protection experience. The formal training may include instruction by outside consultants, and participation at operating reactor facilities in addition to on the job training, in-house instruction and examinations. The following is a general outline of the Initial Technician Training Program:

Introduction to Radiation Protection, (General topics: Mathematical computations, Basic Atomic and Nuclear Physics, Radiation and Radioactive Decay, Isotope production and disposal, Reactor Fundamentals). Radiation Protection Fundamentals (General topics: Radiation and Contamination Surveys and Control, Posting Requirements, ALARA Applications, Respiratory Protection, Protective Clothing, Radiation Protection Procedures, Decontamination of Personnel and Equipment, Air Monitor Operation and Results Interpretation, Radiation Protection Record Keeping, Appropriate Station Plans and Procedures, Applicable Regulations and Limits, Radiological Emergency Monitoring Program, Radiation Work Permits (RWP), Radiation Protection Job Coverage, Personnel Monitoring and BWR systems training).

Review and Technician Qualifying Examination

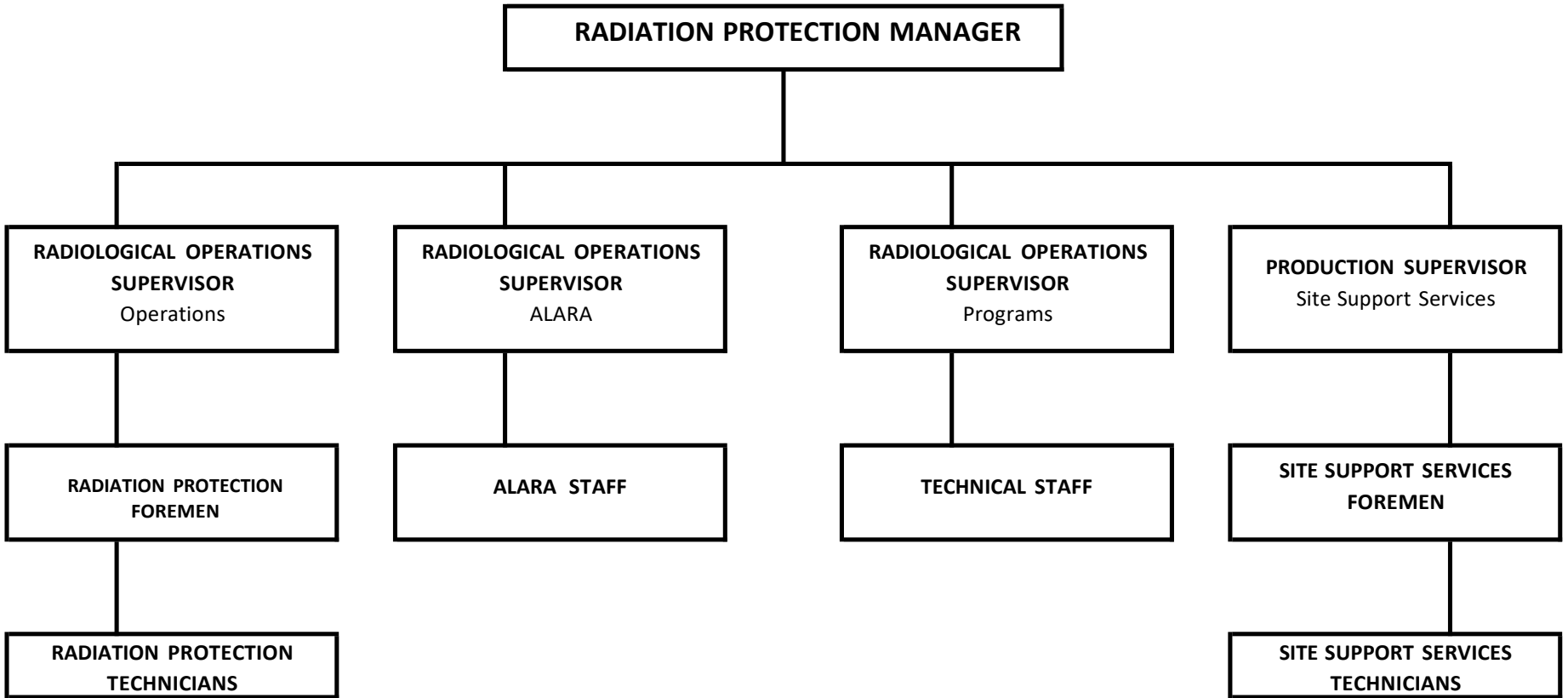
Radiation Protection supervision will review the applicant's proficiency as displayed during the training programs, examinations and the technician qualification examination.

12.5.3.7.2.5 Radiation Protection Technician Retraining Program

All Talen Energy SSES Radiation Protection technicians will receive a retraining review on an annual basis. The purpose of the review will be to strengthen the understanding of Radiation Protection applications and state of the art Radiation Protection technology. Review will consist of formal and/or informal training sessions that will include topics similar to those described in the Radiation Protection course above. One method of evaluating competence in several areas may be the presentation of a hypothetical work situation problem requiring demonstration of Radiation Protection knowledge in a logical progression.

Areas not covered by the problem solving process will be evaluated by means of written and/or oral examinations. Records of training sessions and examinations will be forwarded to the Training Supervisor. An evaluation will be performed to identify areas where supplementary retraining may be necessary. Informal sessions will be held by a member of Radiation Protection supervision to discuss areas of individual concern and additional retraining needs.

Radiation Protection technicians will be subject to all or any portion of the retraining process when deemed necessary by the Radiation Protection Manager or designated alternate based on job performance. They may also request additional training in areas of individual interest. A member of Radiation Protection supervision will evaluate such requests and, if appropriate, pursue specialized informal training to suit individual needs. In this case, performance will not be subject to formal, documented evaluation.



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| SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 AND 2 FINAL SAFETY ANALYSIS REPORT |
| RADIATION PROTECTION ORGANIZATION |
| FSAR FIGURE 12.5-1 |